

Amendments to the Drawings:

The attached drawing sheet includes changes to Figures 1 and 2. In Figures 1 and 2, the designation “41” is removed because it is not referred to in the specification. Also in Figure 1, the designations “15,” “16,” “35,” and “36” are added to be consistent with the specification. These designations are similar to the designations shown in Figures 3 and 4 of the priority document. Also, the item designated by “26” is shown for consistency with Figures 3, 4, and 8 of the priority document. Additionally, the fourth electrode 60 is added to Figure 1, in accordance with the language of claim 3. In Figure 2, the indicators for “102” and “103” are changed to arrows, similar to Figure 9 of the priority document.

REMARKS/ARGUMENTS

In the Office Action mailed July 10, 2007, claims 1-10 were rejected. Additionally, the drawings were objected to. In response, Applicants hereby request reconsideration of the application in view of the amended claims and the below-provided remarks. Claims 2 and 4 are canceled. No claims are added.

For reference, claim 1 is amended to include a limitation related to the limitation recited in claim 2, which is now canceled. Accordingly, claim 3 is amended to depend from claim 1. Claim 1 is also amended to correct a minor grammatical error.

Objections to the Drawings

The drawings were objected to for not showing the fourth electrode and the electrode thickness differences recited in the claims. Applicants submit that the amended drawings show the fourth electrode. Corresponding amendments are presented in the specification to describe the fourth electrode. These amendments are supported, for example, by the subject matter described at page 2, lines 22-26, of the originally filed specification. Accordingly, Applicants respectfully request that the objection to the drawings for not showing the fourth electrode be withdrawn.

In regard to the recited electrode thickness differences, Applicants respectfully submit that the drawings are not required to show the recited electrode thickness differences in any more detail than is already presented in the drawings. Although the cited rule requires that every feature of the invention specified in the claims be shown, this rule does not require that every word in the claims have a corresponding mark in the figures. This rule merely requires that the features, or components, be shown, unless it is otherwise prohibited by the rules. Here, Applicants respectfully submit that the figures do show the features of the claims. Namely, the figures show the second and third electrodes, as recited in the claims. While the figures do not show the exact thicknesses of the second and third electrodes, the omission of specific thicknesses is not a proper basis for objecting to the claims under 37 C.F.R. 1.83 because the figures nevertheless do show the features—the second and third electrodes—recited in the indicated claims. Furthermore, it is noteworthy that MPEP 608.02 prohibits indications of actual scales.

While this rule relates directly to indicating the scale of a drawing, rather than the dimensions of an illustrated feature, the logic of this rule supports the contention that the drawings are merely required to show the general components of the claimed system or apparatus. However, the drawings are not required to provide specific dimensions or manufacturing specification. Additionally, it should be noted that 37 C.F.R. 1.83 explicitly allows components to be represented by “a labeled rectangular box,” in some instances, which implies that components may be shown without specific dimensions or with less than all of the details pertaining to a specific embodiment. Accordingly, since the drawings show the second and third electrodes, even without calling out the specific dimensions of the electrodes, Applicants respectfully submit that the rejection to the drawings for not showing the specific thickness differences is improper and request that the indicated objection be withdrawn.

Claim Rejections under 35 U.S.C. 112, second paragraph

Claims 2 and 3 were rejected under 35 U.S.C. 112, second paragraph. Specifically, the Office Action states that the limitation “the dielectric layer” of claim 2 lacks antecedent basis. Applicants appreciate the Examiner’s observation and submit that claim 2 is canceled and, hence, the corresponding rejection is moot. Furthermore, the amended subject matter of claim 1 refers to the piezoelectric layer, rather than the dielectric layer, and is supported by proper antecedent basis. Accordingly, Applicants respectfully requests that the rejections under 35 U.S.C. 112, second paragraph, be withdrawn.

Claim Rejections under 35 U.S.C. 102 and 103

Claims 1, 2, 4, and 6 were rejected under 35 U.S.C. 102(b) as being anticipated by Peng et al. (U.S. Pat. Pub. No. 2002/0109436, hereinafter Peng). Additionally, claims 1, 2, 4, 6, 7, and 10 were rejected under 35 U.S.C. 102(e) as being anticipated by Mehta (U.S. Pat. Pub. No. 2004/0075366, hereinafter Mehta). Additionally, claim 3 was rejected under 35 U.S.C. 103(a) as being unpatentable over Mehta in view of Needham et al. (GB 2,353,410, hereinafter Needham). Additionally, claims 5, 8, and 9 were rejected under 35 U.S.C. 103(a) as being unpatentable over Mehta. However, Applicants

respectfully submit that these claims are patentable over Peng, Mehta, and Needham for the reasons provided below.

Independent Claim 1

Claim 1 recites “wherein the first and the second electrode are arranged such that the first electrode is in contact with the piezoelectric layer in the second, closed position of the movable element” (emphasis added). To maintain a proper perspective of this limitation, it should also be noted that claim 1 recites “a first electrode that is present on a surface of a substrate” (emphasis added).

In contrast, Peng does not disclose an electrode that is present on a surface of a substrate and in contact with the piezoelectric layer in a closed position. Peng merely discloses applying sufficient voltage to the piezoelectric films to cause the arms to bend and cause contact between the first and second electrodes. Peng, paragraph 19. More specifically, the second electrode connected to substrate remains stationary while the first electrode moves into contact with the second electrode by virtue of the bending piezoelectric films. In other words, Peng merely discloses the electrode attached to the substrate as contacting the other electrode. Since the first electrode which is caused to contact the second electrode is not a piezoelectric layer, Peng does not disclose the second electrode coupled to the substrate as contacting the piezoelectric film. Moreover, the illustrations provided in Peng convey that the movement of the first electrode relative to the second electrode is constrained by the piezoelectric film and the support arms. In fact, Peng specifically states that the support arms, to which the piezoelectric film is adhered, are firmly positioned in the substrate with a central portion being distanced to the substrate. Peng, paragraph 17. With respect to the central portion of the support arms, Peng states that the first electrode is provided on the surface of the central portion. Peng, paragraph 18. Peng further states that the second electrode is provided on the surface of the substrate facing the central portion. Peng, paragraph 18. Thus, Peng provides a very detailed description of the alignment of the first and second electrodes at the central portion of the support. Additionally, Peng states that the bending of the support arms controls the distance between the first and second electrodes. Peng, paragraph 19. Controlling the distance between the first and second electrodes allows the

device to function as a tunable capacitor (when there is no contact) or a switch (when there is contact). Peng, paragraph 21. In contrast, Peng does not describe any relevant distances between the second electrode and the piezoelectric films because the configuration described in Peng does not allow contact between the second electrode and the piezoelectric films. Therefore, Peng does not disclose all of the limitations of the claim because Peng does not describe the second electrode in contact with the piezoelectric film when the device is in a closed position. Accordingly, Applicants respectfully submit that claim 1 is patentable over Peng because Peng does not disclose all of the limitations of the claim.

Mehta also fails to disclose all of the limitations of claim 1. With reference to Figures 2A-C and 3A-B, Mehta merely describes a switch that makes contact between first and second contact pads 119 and 120. More specifically, as voltage is applied to the several electrodes of the piezoelectric layers 110 and 111, the active piezoelectric layers exhibit displacement to control the distance between the contact pads 119 and 120. Mehta, paragraphs 37-39. Mehta further explains that, in a preferred embodiment, the electrode 112, which is between the piezoelectric layer 111 and the first contact pad 119, extends along the whole length of the piezoelectric layer “in order to avoid contact” with the Si_3N_4 layer, which is between the electrode 112 and the first contact pad 119. Mehta, paragraph 37. Hence, the lower piezoelectric layer 111 is prohibited from contacting the Si_3N_4 layer, the first contact pad 119, and also the second contact pad 120 mounted on the substrate 117. In a similar manner, the upper piezoelectric layer 110 is also prohibited from contacting the Si_3N_4 layer, the first contact pad 119, and the second contact pad 120 mounted on the substrate 117. Therefore, Mehta does not disclose all of the limitations of the claim because Mehta does not describe the second contact pad in contact with the piezoelectric layers, even when the device is in a closed position. Accordingly, Applicants respectfully submit that claim 1 is patentable over Mehta because Mehta does not disclose all of the limitations of the claim.

Dependent Claims 3 and 5-10

Claims 3 and 5-10 depend from and incorporate all of the limitations of the corresponding independent claim 1. Applicants respectfully assert claims 3 and 5-10 are

allowable based on an allowable base claim. Additionally, each of claims 3 and 5-10 may be allowable for further reasons.

CONCLUSION

Applicants respectfully requests reconsideration of the claims in view of the amendments and remarks made herein. A notice of allowance is earnestly solicited.

At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account **50-3444** pursuant to 37 C.F.R. 1.25. Additionally, please charge any fees to Deposit Account **50-3444** under 37 C.F.R. 1.16, 1.17, 1.19, 1.20 and 1.21.

Respectfully submitted,

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